(54) **ASTIGMATISM CORRECTION AND FOCUSING METHOD FOR CHARGED PARTICLE OPTICAL TUBE**

(57) Abstract:

PROBLEM TO BE SOLVED: To make a highly accurate correction for astigmatism by obtaining Fourier transformation images via the focal distances of a lens at different set values, and making the correction on the basis of the cross sectional forms of beams identified through the different focal distances.

SOLUTION: Secondary particle signals are extracted through an objective lens at two different focal distances and, thereafter, two-dimensional Fourier transformation values I (kx, ky) and I' (kx, ky) are obtained for each focal distance. Thereafter, the value of R (kx, ky) determined by a relationship of differences of the magnitude of each of absolute values $|I$ (kx, ky)$|$, and $|I'$ (kx, ky)$|$ is obtained. The direction of astigmatism is, then, obtained from the value of α, provided that the component of the value of R (kx, ky) proportional to an exponent (i2θ) or (-i2θ) for the angle θ of (kx-ky) space is expressed as $A\exp$ (I (2θ+α) or $A\exp$ (-i(2θ+α)) for a positive real number A and a real number α. Then, stigmata are adjusted so as to minimize the real number A. As a result, a correction can be made, regardless of the surface shape of a sample.

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